WALTER H. FLOOD & CO., INC.

Investigation No. 7205-0068
Application for Permit to Develop and
Operate a Solid Waste Management Site
Sauk Trail and CMSP & PRR
South Chicago Heights, Illinois

Prepared for

LoBue Excavating Company
344 East 16th Street
Chicago Heights, Illinois 60411

June 13, 1973

Triem Steel & Processing, Inc
R5-8410-01
IL-0043
IL-0044-4

WALTER H. FLOOD & CO., INC. Investigation No. 7205-0068

APPLICATION FOR PERMIT TO DEVELOP AND OPERATE A SOLID WASTE MANAGEMENT SITE

Table of Contents

note: this report was prepared for a site (Lobue #2) which is 1/4 mile S. of Triem.

REFERENCE 1
SITE NAME TRIEM STEEL
SITE ID ILD001744572

APPLICATION FOR PERMIT
TO DEVELOP AND OPERATE
A SOLID WASTE MANAGEMENT SITE

In Accordance With The Environmental Protection Act

All information submitted as part of the Application is available to the public except when specifically designated by the Applicant to be treated confidentially as regarding a trade secret or secret process in accordance with Section 7(a) of the Environmental Protection Act.

APPLICATION MUST BE SUBMITTED IN DUPLICATE

DO NOT WRITE IN THIS SPACE - FOR E.P.A. USE ONLY.

_____ County - Land Pollution Control

_____/_____

Application Received: _____ Permit Number _____

Reviewed by: Geol.( ) Engr.( ) Op.( ) L.P.C. Region _____

Date: _____ Plan File Ref: _____

Letter Attached: _____ Permit: Granted _____ Denied _____

Notice To: _____ Date: _____

_____ Type of Solid Wastes Site:

_____ ( ) Sanitary Landfill
( ) Incinerator
( ) Composting
( ) Other _____

PART I - APPLICANT INFORMATION

A. SITE IDENTIFICATION

1. Name of Applicant LoBue Excavating Company
(Person responsible for operation)

2. Address of Applicant 344 East 16th Street
(Street, P. O. Box, or R. R. #)

Chicago Heights, Illinois 60411
City State Zip Code

Telephone: 757-6666
(Area Code) (Number)

3. Name of Land Owner FIRST NATIONAL BANK IN CHICAGO, TRUSTEE U/T/A 162
(If same as above, so indicate)

4. Address of Land Owner 1648 HALSTED
(Street, P. O. Box, or R. R. #)

Chicago Heights ILLINOIS 60411
City State Zip Code

5. Name of Site _____

6. Address of Site Sauk Trail, CMSP & PRR
(Street, P. O. Box, or R. R. #)

South Chicago Heights, Illinois 60411
City State Zip Code

Cook County Bloom Township

7. Land ownership (Check Applicable Boxes)

(x) Presently Owned by Applicant ( ) To Be Leased by Applicant For ____ Years
( ) To Be Purchased by Applicant ( ) _____ Years of Lease Remaining: termination date of lease _____

Operated by: Ill. Corporation (x) Parternership ( ) Government ( )
Individual ( ) Other ( )

SITE BACKGROUND (Check Applicable Box or Boxes)

8. (x) This is an existing operation begun April (mo.) 1952 (yr.).
( ) This is a proposed operation.
( ) This is a proposed extension of an existing adjacent operation:
Illinois E.P.A. Permit No. _____: No Illinois E.P.A. Permit ( ).

PART II - LOCATION INFORMATION

ZONING AND LOCAL REQUIREMENTS

9. Present zoning classification of site industrial.

10. Does present zoning of site allow the proposed usage? (x)Yes ( )No.

11. Restrictions (if any) None

12. Check applicable boxes which describe the use of adjacent properties surrounding site.

	Residential	Commercial	Industrial	Agricultural	Others*
a. North	( )	( )	(x)	( )	( )
b. East	( )	( )	(x)	( )	( )
c. South	( )	( )	(x)	( )	( )
d. West	( )	( )	( )	(x)	( )

*SPECIFY USE CLASSIFICATION _____

13. a. Are there any permits, operational requirements, licenses, or other requirements or restrictions by any municipality, planning commission, county, county health department, state agency, or other governing body? ( ) Yes (X) No If yes, list below. _____

_____

_____

b. Have these requirements, licenses or restrictions been approved by the agency or governing body having jurisdiction? ( )Yes ( )No

c. If the answer to (b) is yes, include photocopies of supporting documents.

B. LOCATION

14. Attach a copy of the United States Geologic Survey (U.S.G.S.) topographic quadrangle map of the area which contains the site. (7.5 minute quadrangle, if published).

Quadrangle Map Provided: Dyer, Ill-Ind., 1953 (Name) Steger, Ill., 1953 (Date)

15. a. Outline on the U.S.G.S. topographic quadrangle map the location and extent of the site.

b. Provide a legal description of the site. (Typewritten on attached sheet.)

about 25 acres in _____ Quarter, NE Quarter, _____ Quarter

of Section 33, Township 35N, Range 14 E of 3rd P.M.

c. Provide State Plane coordinates of the southwest corner of the site, using the State Plane Coordinate System:

_____ feet east, _____ feet north or origin, (X) east zone ( ) west zone

16. General characteristic: (Flood Plain, Hillside, Field, Strip Mine, Quarry, Gully, Gravel Pit, Swamp, etc.)
Briefly describe: Formerly a clay mine; in process of being filled for about 20 years

_____

_____

17. Plot the following information on the U.S.G.S. quadrangle topographic map, if within the site or adjacent to the outer perimeter of facility:

a. Wells (domestic, industrial, etc.)
b. Public water sources (wells, stream, etc.)
c. Residences or residential areas, commercial facilities, sewage treatment facilities, industries, institutions, etc.
d. Other pertinent facilities not shown on topographic map such as diverted streams, strip mines, ponds, etc.

If scale of quadrangle map is not sufficient, show the above items on a separate topographic map (See Part IV - A - 23).

PART III - SITE CHARACTERISTICS

A. GEOLOGY - HYDROLOGY

NOTE: The instructions for this Part of the Application should be read carefully prior to initiating the data-gathering program for the site.

Provide subsurface information in comprehensive detail, sufficient to allow for thorough evaluation of the hydrologic and geologic conditions beneath and surrounding the site. This data must fully describe the hydrogeologic interrelationships of the landfill facility, local ground waters, and surface waters. All information requested in sections 18 through 22 should be integrated and presented as a detailed hydrogeologic report.

B. GEOLOGY

GENERAL GEOLOGIC SETTING

18. Provide a brief description of the general geography of the region in which the site is located, and a summary of the hydrogeologic conditions typical of that portion of Illinois.

TYPE AND EXTENT OF SUBSURFACE MATERIALS

19. Provide a complete log (description) of each boring made during the exploratory program, and include all other pertinent data so obtained.

20. Include the following information regarding the bedrock, if encountered during the boring program:

    a. Depth(s) to bedrock.
    b. Lithology (physical character) and hydrologic characteristics of the bedrock formation.
    c. Name and age of the formations encountered during the boring operation and (or) which crop out on or adjacent to the site.

C. MATERIALS CLASSIFICATION AND ANALYSIS

21. Provide the following information for samples taken during the boring operation:

    a. textural classification (U.S.D.A. system)
    b. particle size distribution curves for representative samples
    c. coefficient of permeability - based on field and (or) laboratory determinations
    d. ion-exchange capacity and ability to adsorb and "fix" heavy metal ions

D. HYDROLOGY

22. Provide the following information regarding the hydrologic flow system in the area of the site:

    a. Depth to water in boreholes at time of boring completion and periodic measurements until the water level has stabilized.

b. Rate(s) and direction(s) of ground-water movement.
c. A narrative description (with diagrams) of the design and installation procedures for all piezometers installed at the site. This shall include both water-level measuring piezometers and those installed for permanent use as water-quality monitoring points.
d. An analysis of the background ground-water quality, as per those constituents listed in the Instructions. Attach a copy of the laboratory report.
e. An outline of the procedures, devices, and personnel to be employed for the collection of periodic ground-water samples from the monitoring point(s) installed at the site.

PART IV - CONSTRUCTION PLANS AND SPECIFICATIONS

A. SITE DEVELOPMENT PLAN

23. Provide a detailed topographic map of the existing site (Scale 1" = 200' or larger) showing 5-foot contour intervals on sites (or portions thereof) where the relief exceeds 20 feet, and 2-foot contour intervals on sites (or portions thereof) having less than 20 feet of relief. This map should show all buildings, ponds, streams, wooded areas, bedrock outcrops, underground and overhead utilities, roads, fences, culverts, drainage ditches, drain tiles, easements, streets, any other item of significance, including legal boundaries.

    Show the location and elevation of borings as described in Part III - 19, 20.

24. Provide a separate map, at the same scale as that above, of the developed site showing the following:

    a. All changes in topography dictated by design and operational factors.
    b. All surface features (as specified in IV - A - 23) both unaltered and modified, and installed as part of the facility. This shall include all new construction with location plans for berms, dikes, dams, earth barriers, surface drainage ditches, drainage devices (culverts, tiles), fencing, access roads, entrance(s), utilities, buildings, sanitary facilities, monitoring well(s), streams, ponds, mines, and any other special construction as may be required to comply with the provisions of the Rules and Regulations.

25. Provide a topographic map of the closed and covered site showing final contours, with an interval of 5 feet if relief is greater than 20 feet, and intervals of 2 feet if relief is less than 20 feet.

26. Provide cross sections or profiles (Scale 1" = 200' or larger) of the developed site to clearly indicate: (Minimum of three cross sections recommended)

    a. Proposed fill areas
    b. Sequence of placement and total compacted thickness of each lift
    c. Thickness of cover material for each lift
    d. Slope and width of working face for each lift
    e. Slope of completed fill with final cover in place
    f. Subsurface strata to a minimum depth of thirty feet below the base of the fill material
    g. Earth barriers, berms, dikes and other barriers, including essential dimensions of each

27. Provide plan views (Scale 1" = 200') and cross sections of the leachate collection and treatment system, if utilized, including the following information:

a. Type, location and construction of subsurface collection system, and all attendant devices.
b. Location, size, depth, volume, and surface elevation of treatment lagoon(s), if used.
c. Detailed written narrative of the method and processes of the treatment system, and program for monitoring the performance and effectiveness of the treatment system.
d. Discharge point(s) of effluent.

B. SCHEDULE OF CONSTRUCTION

28. Attach a typewritten narrative supplemented by indications on the plans of the sequence of areas to be filled. Estimate the date of beginning and ending of each phase of construction and operation.

C. CONSTRUCTION REQUIREMENTS

29. Attach a typewritten narrative supplemented by indications on the plans of provisions to be made for:

a. Prevention of surface-water pollution.

b. Control of gas migration.

c. Elimination of flood hazard, if any.

d. Employee facilities.

e. Access to the site.

f. Measuring quantity of solid waste delivered to the site.

PART V - OPERATING PLAN

A. SOURCE AND VOLUME

30. Indicate the estimated volume of each of the following sources and types of solid waste the facility will handle during each day of operation; each week of operation; each year of operation. Specify any additional information regarding refuse source and volume.

SOURCE	TYPE	DAILY VOL.	WEEKLY VOL.	ANNUAL VOL.
a. Residential				
b. Commercial				
c. Industrial	foundry sand, slag, cinders	60 c.y.	300 cu.yds.	15,600c.y.
d. Agricultural				
e. Other (Describe)	soil, clay	10 c.y.	50 c.y.	2,600 c.y.

31. At the above projected rate of use, what is the expected useful life of the facility? 30 years

32. Will water treatment or wastewater treatment sludge be accepted at the facility ( )Yes (X)No. If the answer is yes, all pertinent information requested in Part VI of the Application form must be provided.

33. If "hazardous wastes" (other than waste water sludges) will be accepted at the facility, list these wastes, provide a complete chemical analysis of each, and attach a detailed description of the special procedures to be used for their disposal at the facility..

B. DESCRIPTION OF OPERATING PROCEDURES

34. Attach a typewritten plan of operation to accompany this application. This plan should include the following subjects:

a. Method of landfilling (trenching, area fill)
b. Time schedule for filling and daily covering

C. OPERATING REQUIREMENTS

35. Attach a typewritten description of provisions for:

a. Personnel for supervision and operation
b. Traffic control
c. Designation of unloading area
d. Cell size and construction
e. Provisions for blowing litter control
f. Rodent control
g. Fly control
h. Bird control
i. Dust control
j. Odor control
k. Management of surface water
l. Erosion control
m. Final cover and final slopes
n. Monitoring program for gas
o. Reuse and recycling operations
p. Monitoring program for groundwater (See Part III - D - 22)

36. Provide a list of equipment to be used for the landfill operation:

ITEM(S)	MODEL NUMBER	NO. OF UNITS IN OPERATION	DESCRIPTION
	D-7	1	Dozer

PART VI - ON - SITE SLUDGE DISPOSAL

The information requested in this Part of the Application form must be provided only if water treatment or wastewater treatment sludge is proposed to be accepted for disposal at the site.

37. Indicate the type of sludge to be accepted at the facility for ultimate disposal: none

( ) Water treatment
( ) Wastewater treatment

( ) municipal	( ) filter cake	( ) raw
( ) industrial	( ) sludge cake	( ) digested
( ) combined	( ) heat-dried	

38. Provide a brief narrative of the wastewater or water treatment processes and operations utilized at the treatment facility generating the sludge in question.

39. Provide a brief narrative of the sludge de-watering and (or) sludge drying operations utilized at the treatment plant. What is the expected solids content (by weight) of the processed sludge? none

40. If industrial or combined wastewater sludges are proposed to be deposited at the site, provide a comprehensive chemical analysis of same. Attach a copy of the laboratory report as part of the Application. Provide a brief description of the manufacturing process(es) which results in the generation of the industrial wastewater including all chemical reagents used during such processing.

41. Provide a reasonable estimate of the projected volume of processed sludge to be deposited at the site on a unit time basis. Specify any additional information regarding sludge generation.

SOURCE	WEEKLY VOLUME	MONTHLY VOLUME	ANNUAL VOLUME	OTHER INTERVAL	INTERVAL
A. Municipal	none				
B. Industrial	none				
C. Combined	none				

42. Provide a brief statement describing the method of sludge conveyance to the refuse disposal site from the treatment facility. This shall include an attached typewritten list of equipment and personnel to be used for sludge handling and transport.

43. Outline in a concise statement the operational procedures to be used on-site to properly and expeditiously dispose of the sludge at the operational portion of the facility. Describe the provisions to be made available for an odor control program if nuisance conditions arise from the disposal of raw or partially digested sludges.

44. Attach a typewritten description supplemented by indications on the plans of provisions for final grading and, if applicable, revegetation of the completed landfill areas. State what arrangements will be made for the repair of eroded, cracked and uneven areas, and any other maintenance of the site until its pollution potential is adjudged exhausted.

45. By signature affixed to this Application for Permit the Applicant affirms his intent to record description and plan of the completed site with the county official responsible for maintaining titles and records of the land, in accordance with the Rules and Regulations of this Agency, if granted a Development and/or Operating Permit.

I hereby affirm that all information contained in this Application is true and accurate to the best of my knowledge and belief.

Signature of Applicant: LOBUE EXCAVATING COMPANY Dec 12, 1974
Date

~~Attest~~ BY: Charles G. LoBue V.P. _____
Date

Walter H Flood & Company, Inc

Signature of Engineer: Raymond J Flood June 14 1973
Registered Professional Engineer
Illinois 21775
Date

Illinois Reg. No.: _____

Attest: _____ _____
Date

(Seal)

Signature of other person, technical and non-technical, who has supplied data contained in the submittal.

_____ _____
Signature Date

_____
Reg. No., Position, Title, Etc.

(Seal)

_____ _____
Signature Date

_____
Reg. No., Position, Title, etc.

(Seal)

SUPPLEMENTAL TEXT TO APPLICATION FOR PERMIT

Part III - Site Characteristics

A. Geology - Hydrology: Field Investigation

Four test borings were taken on the site (for logs see Appendix). The locations of these borings are plotted on the enclosed diagram of the topographic survey (Appendix sheet 27). One test boring was cored 5 feet into bedrock to verify the lithology of the bedrock and the other borings were stopped at "refusal," thought to be the bedrock surface. The field investigation was made on April 25, May 22, May 23, and May 24, 1972. A truck-mounted drill rig was used. Split tube samples were taken from each borehole and the standard penetration (number of blows of a 140-inch hammer dropping 30 inches to drive the 2-inch outside diameter split-tube one foot) was taken and recorded on the boring log. Ground water levels were recorded during drilling and after drilling was completed. After completion of the drilling a 2-inch pvc well point was installed in each borehole. The data on the well installation is included in the appendix, Page 37 . Each well point is also shown symbolically on the soil profiles (Appendix sheets 29-30). The procedures used in the installation of the well points are also included in the appendix. Periodic ground water levels were taken in the wells and samples taken from the test wells on February 22 and 23, 1973, and the samples submitted to a laboratory for testing. The results of the tests of the water from the wells are also included in the appendix of this report, Pages 41-44.

A topographic survey was made of the site, and is included herein. A research of available geological and hydrological data from the company files was made. References used in the study include:

U.S. Geological Survey, Hydrologic Atlases HA209, 301

Geology of the Chicago Region, Illinois State Geological Survey, Bulletin 65

Pleistocene Stratigraphy of Illinois, Illinois State Geological Survey, Bulletin 94

Characteristics of Soils Associated with Glacial Tills in Northeastern Illinois, Agriculatural Experiment Station, University of Illinois, Bulletin 665

Summary of the Geology of the Chicago Area, Illinois State Geological Survey, Circular 460

Mineralogy of Glacial Tills and their Weathering Profiles in Illinois, Illinois State Geological Survey, Circular 347, 1963.

Public Water Supplies of Illinois, Illinois State Water Survey, Bulletin 40 and supplements

Water Well Logs, Illinois State Geological Survey, Urbana, Illinois.

B. Geology (See Surficial Geology, Appendix page 28)

The project site is located mostly on the terminal moraine of the Tinley Glacier. It is likely that Lake Steger, a postglacial lake, had its easterly shoreline along the project site. The Tinley glacial tills were deposited over the previously deposited Valparaiso and older glacial tills and drifts. Reference is made to two soil profiles (Appendix pages 29-30) which have been prepared from the test boring data. These test borings reveal the following identifiable geological soil and rock strata.

Tinley glacial tills. A highly impervious, generally desiccated, very tough to hard consistency clay till occuring in two borings. This clay was likely partially removed

III - Site Characteristics (continued)

Geology (continued)

or excavation. Thickness was likely variable, exceeding 30 feet in the higher ons of the site.

lity Formation Carmi Member. A small portion of the site was likely inun- by the waters of the postglacial Lake Chicago. Clay sediments deposited gh the relatively quiet lake waters were encountered in one boring. These are tough in consistency, plastic, and highly impermeable.

raiso clay tills. These clay tills were encountered in all borings and are a ompressed, hard consistency, highly impervious clay with small amounts of l. Thickness ranges from about 10 to 20 feet.

ont drift. Immediately above the bedrock a silt loam-gravel-boulder drift was ntered. This drift is a highly preconsolidated noncohesive drift ranging from to over 10 feet thick.

ran Dolomite. Test boring 2 was cored 5 feet with 100% core recovery. A y-bedded argillaceous dolomite was encountered. Occasional jointing was rved. The bedrock is the Silurian age Niagran dolomite.

glacial stratas. Intermittently between the till sheets, sand and silt stratas e encountered. These sheets of inter-till soils range from a few to 10 feet thick.

General Geography-Hydrogeology

project site originally apparently sloped rapidly from east to west with an vation difference of about 45 feet (from 685 to about 730). Along the west perty line is a creek (drainage ditch), a tributary to Deer Creek, draining thward and then eventually into the Little Calumet River several miles north- terly. Most of the surface water of the site drains into this ditch. No shallow ifer was encountered until the sand, Lemont drift (basal aquifers) were encountered ove the bedrock. The potable water source of the area is generally the Niagran dolomite.

Subsurface Exploration

e logs of four test borings are included in the appendix of this report (Pages 19-22). ese borings were taken at locations indicated on the site topography map.

Bedrock

drock was cored in boring 2, being encountered at a depth of 31.5 feet, elevation 663.4. At the other boring locations "refusal" was encountered at depths of about to 62 feet, or at elevations 658.3, 660.9, and 650.1. Although, not cored at se other locations it is believed that the refusal depth likely indicates the bedrock surface. The cored bedrock was thinly bedded in layers of about 2 to 8 inches, and argillaceous with numerous pin-sized solution cavities. The Niagran dolomite is Silurian in age. We have prepared a configuration of the surface of the Niagran dolomite in the general site area by plotting the data from well logs furnished by

Part III - Site Characteristics (continued)

20. Bedrock (continued)

the State Geological Survey (Appendix Page 32). Thickness of the Silurian Niagran dolomite is expected to be in excess of several hundred feet and appears as 383 feet thick in the log of the Chicago Heights Illinois Municipal Well.

The Niagran dolomite is the aquifer for potable water for small wells of the area. The water is generally stored in a complex network of interconnected openings. The rock is generally jointed and fractured. No analysis was made of well yields in the area.

The Lemont boulder drift and its overlying sand layer are estimated to be basal drift aquifers. Piezometric water levels in these drift aquifers are common to the underlying bedrock aquifer. The use of the drift aquifers is likely very limited and no known wells in the area terminate in this aquifer.

21. Soil Classification

Representative samples from the test borings were tested in the laboratory. Textural classification was made by the U.S. Department of Agricultural System, and grainsize (Appendix, Pages 33-36).

The Tinley tills are clays, and the Valparaiso tills also are silty clay loams. Permeability tests (remolded) were conducted on representative samples of these soils and the coefficients of permeability ranged from 2×10^{-7} cm/sec to 5×10^{-7} cm/sec.

These clay fills were not tested for cation exchange capacity but reference materials indicate a high exchange capacity and ability to absorb heavy metal ions.

22. Hydrology

Ground water readings were taken in all of the boreholes and the readings recorded on the test boring logs. Two-inch ID PVC well points were installed in each of the test holes and readings taken and recorded. The summary of the observation well data is enclosed in the appendix, Page 37.

The direction of ground water flow in the Niagran basal aquifer across the site is southerly and the enclosed contour drawing, Appendix, Page 27, of the potentiometric water levels in the area as obtained from the on-site data and from the furnished well logs indicates this. No upper aquifer was encountered in the test borings, but it is assumed that ground water is present in the clays above the present creek level of about 585, and there is a gradient towards the creek.

Installation procedures for the piezometers is enclosed in the appendix, Pages 39-40.

Laboratory reports of ground water tests for wells 1, 2, 3 are enclosed (Appendix, Pages 41-44). The rate of flow into well 4 was extremely slow and well 4 was not sampled. The results of these tests indicate relatively uncontaminated ground water.

Ground water sampling from a selected individual well is planned quarterly. Sampling will be done from the well by bailing, by qualified personnel from a testing laboratory. Results of the tests will be forwarded.

Part IV - Construction Plans and Specifications

23. Existing Topographical Map (see Appendix, Page 27)
The site has been in the process of being filled for about 20 years and formerly was a borrow for clay for brick manufacture.

24. The proposed operation is to complete the filling from present grades.

25. Proposed Grade Plan (see Appendix, Page 45)
It is planned to complete the filling to the final grades as indicated. The proposed final grades will return the site to near the same topography as prior to excavation.

26. Fill Cross-section (see Appendix, Page 46)
The fill is to be placed in lifts of a few feet and compacted with the tractor. Cover material will be placed as required daily. An area fill method is planned.

27. Leachate Collection System
Due to the nature of the proposed and existing fill little leachate generation is expected. No plans for leachate collection are included. A sample of water was collected from the creek and tested (see Appendix, Page 44). Monitoring of the creek and wells will be conducted on a regular basis. Should leachate be detected seeping from the creek slope an interceptor till can be constructed at the toe of the slope, and treatment provided or the leachate pumpted to an available sanitary sewer.

28. Schedule of Construction
Plans are to recommence filling of the site upon receipt of the permit. Only a small amount of solid waste is expected to be placed in the site. At the projected rate about 30 years will be required to till the site daily.

29. Construction Requirements
(a) Surface water pollution will be prevented by temporarily providing storage of surface water. Should contamination be detected treatment will be provided.

(b) Due to absence of petrucible materials in the fills little gas generation has been noted and little or no gas generation is expected from future fill. If gas generation is detected vent wells will be provided.

(c) Hydrologic Atlases HA209 and 301 indicate flooding as being confined to the limits of the creek banks. No change in flood plain is planned.

(d) Due to the planned intermittent operation of the site (5 to 10 trucks daily), no employee facilities are planned.

(e) Access to the site is through an existing gate as noted on the existing contour drawing, Appendix Page 28.

(f) Measuring of the quantity of solid waste delivered to the site will be by truck measurement.

Part IV - Construction Plans and Specifications (continued)

34. Operating Procedures

The area method of fill will be used. Limited use of the site is planned and disposal onto the site will be limited to essentially inert materials as noted under Section 30. Since most of the fill will be inert, little daily covering is expected. Daily cover will be provided as necessary if organic materials are noted in an occasional load of fill.

required - daily cover is mandatory TEC

Time for filling of the site is estimated at 30 years.

Operating hours are from 7:00 AM to 4:00 PM on weekdays and 7:00 AM to 1:00 PM on Saturday.

35. Operating Requirements

(a) Personnel - One operator is to be provided to operate equipment. Intermittent supervision is to be provided by supervisory personnel.

(b) No traffic control is planned due to the small number of trucks anticipated.

(c) Unloading area is to be designated.

(d) Area fill is planned by progressing from east to west. Face of the unloading area is to be limited to 100 feet.

(e) No blowing litter is anticipated. Should blowing litter be involved fencing will be provided.

(f) Commercial rodent control will be provided on a regular basis.

(g) Due to inert nature of the fills, flies have not been noted. Should fly control be necessary, a commercial insect control company will be utilized on a regular basis.

(h) No bird control is planned.

(i) Sprinkling of the access road will be provided on a regular basis during dry weather.

(j) No odor control is planned.

(k) Presently surface water is being collected in a pond and run off by gravity through a ditch. The pond area appears to be a collection of surface water and when the pond is filled surface water will drain directly to the ditch at the west of the site.

(l) Final slopes will have a maximum of 4 to 5% slope, and seeding will be done to provide for erosion control.

(m) Final cover will be 2 feet of soil. Final slopes are indicated on the final grade diagram, Appendix Page 45.

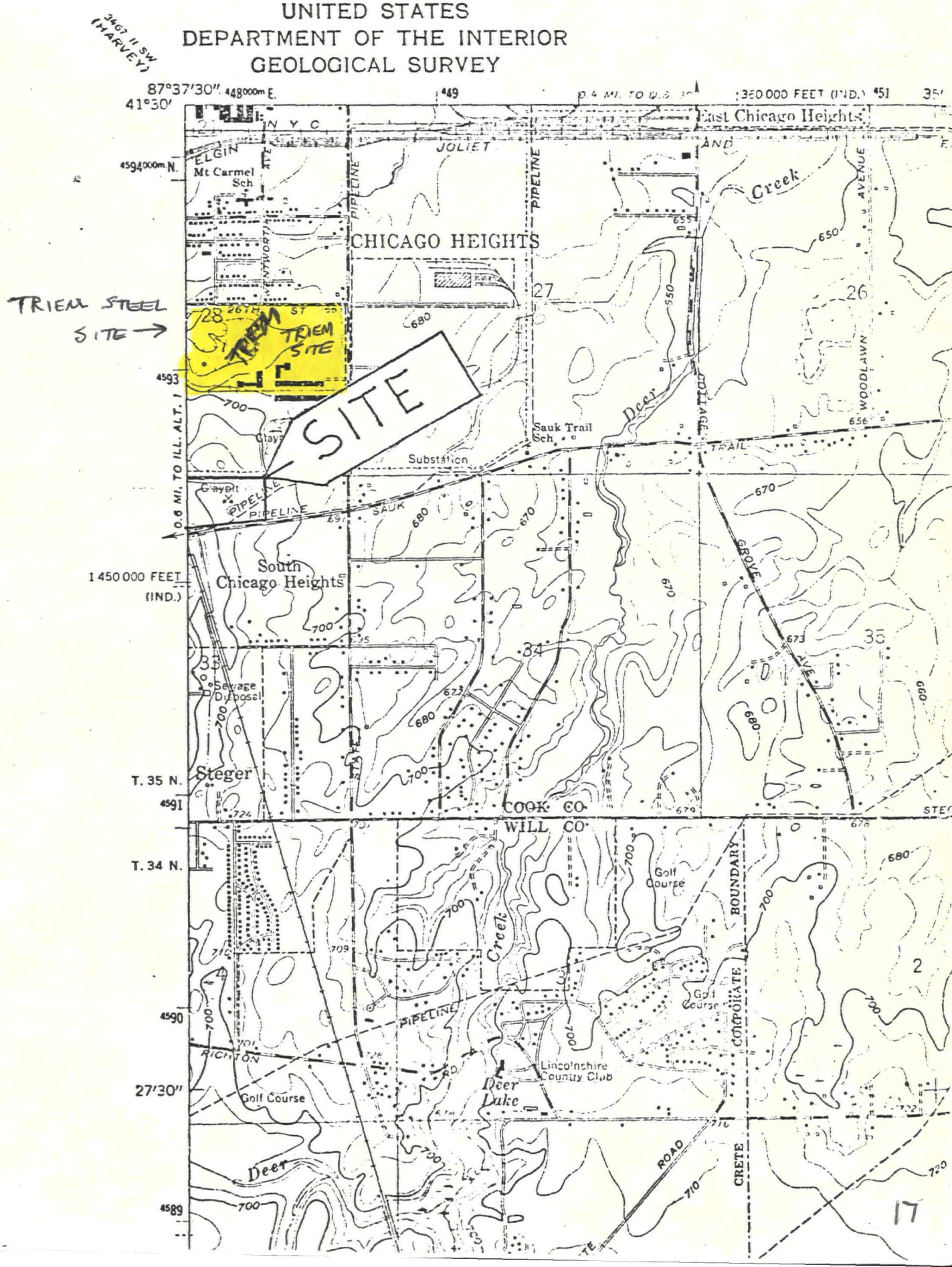
Part IV - Construction Plans and Specifications (continued)

35. Operating Requirements (continued)

(n) A gas well will be installed and monitored regularly.

(o) No reuse or recycling is planned.

(p) Monitoring of ground water will be conducted regularly (see Section III, 22, Page 13 of supplemental text).

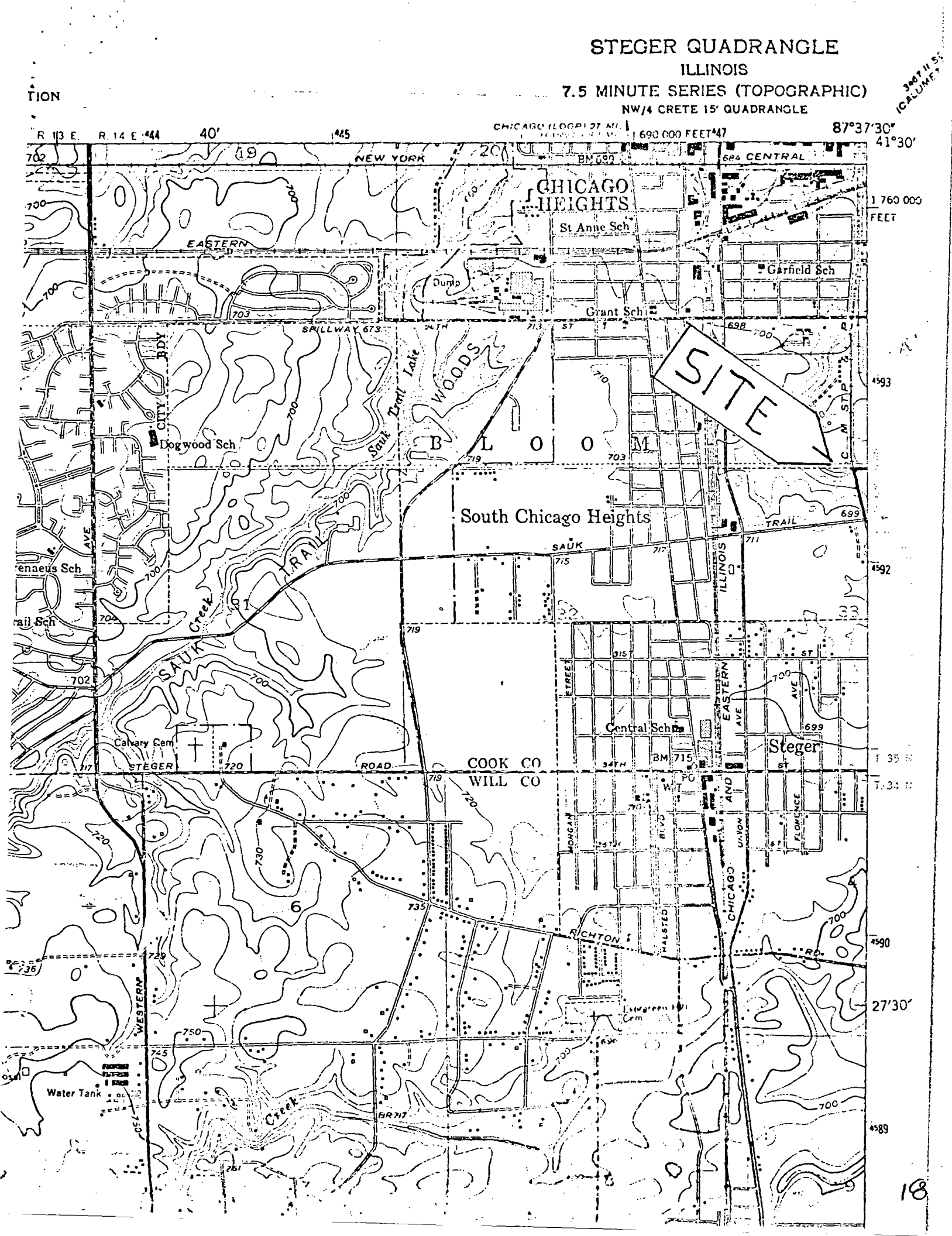

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
87°37'30"
41°30'
East Chicago Heights
CHICAGO HEIGHTS
TRIEM STEEL SITE →
TRIEM SITE
SITE
Sauk Trail Sch.
Substation
South Chicago Heights
Steger
COOK CO.
WILL CO.
Golf Course
Lincolnshire Country Club
Deer Lake
Creek
PIPELINE
JOLIET
ELGIN
Mt Carmel Sch
SAUK TRAIL
WOODLAWN AVENUE
CORPORATE BOUNDARY
CRETE ROAD
RICHTON ROAD
0.6 MI. TO ILL. ALT. 1
T. 35 N.
T. 34 N.
1 450 000 FEET (IND.)
27'30"
17

STEGER QUADRANGLE

ILLINOIS

7.5 MINUTE SERIES (TOPOGRAPHIC)

NW/4 CRETE 15' QUADRANGLE



18

FOR: LoBue Excavating Company

PROJECT: Solid Waste Management Facility

LOCATION: South Chicago Heights, Illinois

SOIL BORING LOG NO. 1

WALTER H. FLOOD & CO., INC.

• Engineers •

• CHICAGO • KALAMAZOO •

METHOD OF BORING: HS&WO
SPLIT SPOON SIZE: 2 IN.
WT. OF HAMMER 140 LBS.
INCH DROP 30
SHELBY TUBE SIZE
CASING USED 40'-2 1/4"IDHS

WATER LEVEL READINGS
15'&37' W.D.
19.3' B.C.R.
20' A.C.R.
35.1' @ 24 HRS. AFTER DRILLING
HRS. AFTER DRILLING

DATE OF BORING: 4-25-73
BY: DL&BS:ic
JOB NO.: 7205-0065
VERTICAL SCALE: 1"=10'

ELEV.	DEPTH	S	T	N	L	R	DD	DESCRIPTION
								Ground surface
697.1	0.0							
		1	ss	10				Fill, cinders, brick, blocks, brown clay
		2	ss	5				
		3	ss	10				
		4	ss	15				
687.1	10.0							
686.1	11.0	5	ss	15				Black clay loam
		6	ss	14				Dark gray to brown clay, very tough
682.1	15.0							
		7	ss	6				Brown silty clay, tough
679.6	17.5	8	ss	12				Brown and gray clay, trace of small gravel, very tough
		9	ss	18				
		10	ss	19				
672.1	25.0							
		11	ss	21				Gray medium to fine sand, trace of silt, medium dense
		12	ss	43				
		13	ss	47				
		14	ss	44				
662.1	35.0							
		15	ss	131				See note 1
658.5	38.6	16	ss	100/0"				Refusal

Note 1: Gray silt, some fine to coarse sand, small to large gravel, boulders, very dense

Note 2: Wash water used from 37.5 to 38.6'

Qu ● LABORATORY O PENETROMETER X 1000

2 4 6 8 10

16.0 5000 27.2 18.5 29.2 7000 20.8 5000 23.8 20000 17.1 9000+ 12.6 6000 13.9 7200

10 20 30 40 50

Wc ▲ NATURAL

ELEV.	DEPTH	S	T	N	L	R	DD	DESCRIPTION

LEGEND: DEPTH—FEET BELOW GROUND SURFACE
S —SAMPLE NUMBER
T —TYPE OF SAMPLE
N —PENETRATION, BLOWS PER FOOT
L —SAMPLE LENGTH
R —LENGTH OF SAMPLE RECOVERED
DD —DRY DENSITY, LB. PER CU. FOOT

WO —WASHOUT
A —AUGER
HS —HOLLOW STEM AUGER
SS —SPLIT SPOON
ST —SHELBY TUBE
FT —FISH TAIL
C —CORE
Wc —WATER CONTENT PERCENT

BCR—BEFORE CASING REMOVAL
ACR—AFTER CASING REMOVAL
WD —WHILE DRILLING
WCI —WET CAVE IN
DCI —DRY CAVE IN
Qu —UNCONFINED COMPRESSIVE STRENGTH POUNDS PER SQUARE FOOT

FOR: Lobue Excavating Company

PROJECT: Solid Waste Management Facility

LOCATION South Chicago Heights, Illinois

METHOD OF BORING: HS&C
SPLIT SPOON SIZE: 2 IN.
WT. OF HAMMER 140 LBS.
INCH DROP 30
SHELBY TUBE SIZE
CASING USED 40'-2 1/4"IDHS

WATER LEVEL READINGS
31.5' W.D.
Surf. B.C.R.
15.2' A.C.R.
30.3' @ 24 HRS. AFTER DRILLING
HRS. AFTER DRILLING

SOIL BORING LOG NO. 2

WALTER H. FLOOD & CO., INC.
• Engineers •
• CHICAGO • KALAMAZOO •

DATE OF BORING: 5-22-72
BY: DL&BS:tc
JOB NO.: 7205-0068
VERTICAL SCALE: 1"=10'

ELEV.	DEPTH	S	T	N	L	R	DD	DESCRIPTION	Qu ○ LABORATORY ○ PENETROMETER X 1000 (2 4 6 8 10)
694.9	0.0							Ground surface	18.5 ; 9000+
693.9	1.0	1	ss	19				Black silt loam Brown and gray clay, trace of small gravel, hard	17.4 ; 9000+ ; 18.8 ; 9000+ ; 17.1 ; 9000+ ; 19.0 ; 9000+ ; 18.5 ; 9000+ ; 19.0 ; 9000+
		2	ss	27					
		3	ss	40					
		4	ss	32					
		5	ss	27					
		6	ss	28					
678.4	16.5	7	ss	31					
		8	ss	8				Gray fine to medium sand, little silt, loose	12.1 ; 8500
674.9	20.0	9	ss	30				Gray silt, some fine to coarse sand, small to large gravel, boulders, very dense	16.0 ; 8500 ; 9.6 ; 9000+
		10	ss	19					
		11	ss	130					
		12	ss	100/5"					
663.4	31.5	13	ss	104/6"					
		14	C					Light-gray dolomite, thinly bedded, numerous small pinsized solution cavities, very dense	
658.4	36.5							End of boring Note: Water used to core bedrock	

ELEV.	DEPTH	S	T	N	L	R	DD	DESCRIPTION	10 20 30 40 50 Wc ▲ NATURAL

LEGEND: DEPTH—FEET BELOW GROUND SURFACE
S —SAMPLE NUMBER
T —TYPE OF SAMPLE
N —PENETRATION, BLOWS PER FOOT
L —SAMPLE LENGTH
R —LENGTH OF SAMPLE RECOVERED
DD —DRY DENSITY, LB. PER CU. FOOT

WO —WASHOUT
A —AUGER
HS —HOLLOW STEM AUGER
SS —SPLIT SPOON
ST —SHELBY TUBE
FT —FISH TAIL
C —CORE
Wc —WATER CONTENT PERCENT

BCR—BEFORE CASING REMOVAL
ACR—AFTER CASING REMOVAL
WD —WHILE DRILLING
WCI —WET CAVE IN
DCI —DRY CAVE IN
Qu —UNCONFINED COMPRESSIVE STRENGTH POUNDS PER SQUARE FOOT

FOR: LoBue Excavating Company

PROJECT: Solid Waste Management Facility

LOCATION South Chicago Heights, Illinois

METHOD OF BORING: HS
SPLIT SPOON SIZE: 2 IN.
WT. OF HAMMER 140 LBS.
INCH DROP 2
SHELBY TUBE SIZE
CASING USED 50'-2 1/4"IDHS

WATER LEVEL READINGS
31.5' W.D.
44.5' B.C.R.
50.2' A.C.R.
49.7'@24 HRS. AFTER DRILLING
HRS. AFTER DRILLING

SOIL BORING LOG NO. 3

WALTER H. FLOOD & CO., INC.
• Engineers •
• CHICAGO • KALAMAZOO •

DATE OF BORING: 5-22-72
BY: DL&BS:bc
JOB NO.: 7205-0068
VERTICAL SCALE: 1"=10'

ELEV.	DEPTH	S	T	N	L	R	DD	DESCRIPTION
713.4	0.0							Ground surface
712.4	1.0							Black clay
		1	ss	11				Brown and gray clay, trace of small gravel, hard to very tough
		2	ss	28				
		3	ss	35				
		4	ss	36				
		5	ss	31				
		6	ss	34				
		7	ss	16				
		8	ss	19				
		9	ss	15				
		10	ss	20				
		11	ss	16				
		12	ss	19				
		13	ss	10				
		14	ss	17				
		15	ss	20				
		16	ss	17				
673.4	40.0							
		17	ss	29				Gray clay, trace of small gravel, hard to very tough
		18	ss	30				
		19	ss	25				
664.4	49.0	20	ss	21				
		21	ss	100/3"				Gray silt, some fine to coarse sand, small to large gravel, boulders, very dense
660.9	52.5							End of boring

Qu ○ LABORATORY ○ PENETROMETER
X 1000
2 4 6 8 10

23.5 5500
18.2 △ ○ 9000+
△ ○
17.6 △ 9000+ ○
16.6 △ 9000+ ○
9000+
18.2 △ ○
19.0 △ 9000+ ○
19.0 △ 9000+ ○
19.3 △ 9000+ ○
18.8 △ 9000+ ○
19.9 △ ○ 6000
5500
21.1 △ ○
22.3
△ 4500 ○
16.6 △ ○ 6000
5500
15.7 △ ○
16.8 △ ○ 4500
16.8 △ ○ 4000
15.7 △ 9000+ ○
△ ○
18.2 △ 9000+ ○
17.1 △ 9000+ ○
△ ○
15.7 7000

10 20 30 40 50
Wc △ NATURAL

LEGEND:
DEPTH—FEET BELOW GROUND SURFACE
S —SAMPLE NUMBER
T —TYPE OF SAMPLE
N —PENETRATION, BLOWS PER FOOT
L —SAMPLE LENGTH
R —LENGTH OF SAMPLE RECOVERED
DD —DRY DENSITY, LB. PER CU. FOOT

WO —WASHOUT
A —AUGER
HS —HOLLOW STEM AUGER
SS —SPLIT SPOON
ST —SHELBY TUBE
FT —FISH TAIL
C —CORE
Wc —WATER CONTENT PERCENT

BCR—BEFORE CASING REMOVAL
ACR—AFTER CASING REMOVAL
WD —WHILE DRILLING
WCI —WET CAVE IN
DCI —DRY CAVE IN
Qu —UNCONFINED COMPRESSIVE STRENGTH POUNDS PER SQUARE FOOT

21

FOR: LoBue Excavating Company

PROJECT: Solid Waste Management Facility

LOCATION South Chicago Heights, Illinois

METHOD OF BORING: HS
SPLIT SPOON SIZE: 2 IN.
WT. OF HAMMER 140 LBS.
INCH DROP 30
SHELBY TUBE SIZE
CASING USED 60'-2 1/4"IDHS

WATER LEVEL READINGS
31.5' W.D. & 49.5'
61.0' B.C.R.
58.4' A.C.R.
51.6' @ 24 HRS. AFTER DRILLING
HRS. AFTER DRILLING

SOIL BORING LOG NO. 4

WALTER H. FLOOD & CO., INC.
• Engineers •
• CHICAGO • KALAMAZOO •

DATE OF BORING: 5-24-72
BY: DL&BS:bc
JOB NO.: 7205-0068
VERTICAL SCALE: 1"=10'

ELEV.	DEPTH	S	T	N	LR	DD	DESCRIPTION
712.6	0.0						Ground surface
							Black clay loam
711.6	1.0	1	ss	8			Brown to gray clay, trace of small gravel, hard to very tough
		2	ss	7			
		3	ss	26			
		4	ss	23			
		5	ss	34			
		6	ss	26			
		7	ss	19			
		8	ss	19			
		9	ss	21			
		10	ss	17			
		11	ss	18			
		12	ss	13			
682.6	30.0	13	ss	16			Gray silt, some fine sand, medium dense to loose
		14	ss	8			
677.6	35.0	15	ss	16			Gray clay, trace of small gravel, very tough
		16	ss	21			
672.6	40.0	17	ss	56			Gray fine sand, little silt, dense
		18	ss	45			
668.6	44.0	19	ss	58			Gray silt, some fine sand, small to medium gravel, dense
		20	ss	39			
664.6	48.0	21	ss	23			Gray clay, trace of small gravel, very tough
662.6	50.0	22	ss	21			Gray fine to medium sand, trace of silt, medium dense
		23	ss	26			
657.6	55.0	24	ss	44			Gray silt, some fine to coarse sand, small to large gravel, occasional boulder, dense to very dense
		25	ss	43			
		26	ss	138			
650.1	62.5						Refusal

Qu ⊖ LABORATORY ○ PENETROMETER
X 1000
2 4 6 8 10

22.9 5000
22.9 5000
17.2 9000+
15.2 9000+
9000+
12.5
16.0
9000+
16.0 5500
17.6 7500
19.9 6000
18.8 7500
19.3 5500
22.9 6000
15.5
24.7
18.2 7000
17.4 8000
12.1
13.6
13.9
18.5 6000

10 20 30 40 50
Wc ▲ NATURAL

ELEV.	DEPTH	S	T	N	LR	DD	DESCRIPTION

LEGEND: DEPTH—FEET BELOW GROUND SURFACE
S —SAMPLE NUMBER
T —TYPE OF SAMPLE
N —PENETRATION, BLOWS PER FOOT
L —SAMPLE LENGTH
R —LENGTH OF SAMPLE RECOVERED
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WO —WASHOUT
A —AUGER
HS —HOLLOW STEM AUGER
SS —SPLIT SPOON
ST —SHELBY TUBE
FT —FISH TAIL
C —CORE

BCR—BEFORE CASING REMOVAL
ACR—AFTER CASING REMOVAL
WD —WHILE DRILLING
WCI—WET CAVE IN
DCI—DRY CAVE IN
Qu —UNCONFINED COMPRESSIVE STRENGTH POUNDS PER SQUARE FOOT

22

WALTER H. FLOOD & CO., INC.

SOIL BORING LOG EXPLANATION

TEXTURAL CLASSIFICATION

Texture	Symbol	Abbreviation
Boulder		Bo
Gravel		GR
Sand		S
Silt		Si
Clay		C

Size	Abbreviation	Soil Particle Size
		over 3.0"
Large	L	1.0" to 3.0"
Medium	M	.38" to .99"
Small	Sm	2.0mm to .38"
Coarse	Co	.75mm to 1.99mm
Medium	M	.25mm to .74mm
Fine	F	.074mm to .24mm
		.005mm to .073mm
		Smaller than .005mm

COHESIVE SOIL CLASSIFICATION

Class	Symbol	Abbreviation	Major Soil Constituent, % of Dry Weight Sand	Silt	Clay
Clay		C	less than 50	less than 50	20–100
Silty Clay		SiC	less than 20	50–80	20–50
Sandy Clay		SC	50–80	less than 20	20–50

Consistency	Abbreviation	N	Qu
very soft	VS	0–2	less than 700
soft	S	3–4	700–1200
stiff	ST	5–8	1201–2000
tough	T	9–16	2001–4000
very tough	VT	17–30	4001–8000
hard	H	over 30	over 8000

If the clay content of a soil is great enough the clay characteristics dominate the soil mass. CLAY becomes the soil classification with the other constituents being modifying.

NON-COHESIVE SOIL CLASSIFICATION

Class	Symbol	Abbreviation	Major Soil Constituent, % of Dry Weight Sand	Silt	Clay
Silt		Si	less than 20	80–100	less than 20
Sand		S	80–100	less than 20	less than 20

Density	Abbreviation	N
very loose	VL	0–4
loose	L	5–9
medium dense	MD	10–29
dense	D	30–49
very dense	VD	50 and over

If the sand or silt content of a soil is great enough the soil becomes non-cohesive or semi-cohesive. The soil classification becomes SAND or SILT with the other soil constituents being modifying.

QUANTITY MODIFIERS

Term	Abbreviation	% of Dry Weight
trace or occasional	tr or oc	0–10
little	li	11–20
some	so	21–35
and or with	& or w/	36–50

WATER LEVELS

Symbol	Explanation
	final water level
WCI	wet cave in
DCI	dry cave in
WD	while drilling

DRILLING AND SAMPLING SYMBOLS AND ABBREVIATIONS

ST	Shelby tube or thin wall tube (ASTM D-1587)
SS	Split spoon or split tube (ASTM D-1586)
A	Auger boring or auger sample
HS	Hollow stem auger
Qu	Unconfined compressive strength, pounds per square foot
N	Standard penetration, blows per foot of 140# hammer, 30" drop, 2" O.D. SS
WO	Washout
C	Core
HA	Hand Auger

Standard Practice for Plugging Soil Borings

1.0 Drilling Soil Borings - Soil borings shall be made in accordance with the recommended practice for soil borings. Drilling may be by any of the methods specified therein subject to the limitations set forth for each method.

2.0 Plugging Soil Borings

2.1 Shallow Borings - Borings of 50 feet in depth or less shall be considered as shallow borings for the purposes of this document unless they encounter one or more of the following conditions:

A. Flowing artesian water

B. Water containing hydrogen sulfide, sulfur dioxide, methane, or other gases

C. Hydrogen sulfide, sulfur dioxide, methane, or other gases

D. Bedrock

Shallow borings shall be plugged by backfilling with excavated material or suitable natural soil from the vicinity of the boring. Backfilling shall be accomplished in such a manner that the hole is filled as completely as practicable

Any boring less than 50 feet in depth which encounters one of the conditions noted above shall be considered as a deep boring and shall be plugged in accordance with the requirements for deep borings set forth in Article 2.2.

2.2 Deep borings - Any boring greater than 50 feet in depth or which encounters one of the conditions set forth in Article 2.1 shall be considered as a deep boring for purposes of the document. The plugging of deep borings shall be accomplished in accordance with the methods set forth herein. On the basis of the field logs prepared during the drilling of the boring, the hole shall be assigned to one of the categories listed below and the appropriate plugging method utilized.

	Natural Soil (A)	Cement (B)	Pressure Cement Grout (C)	Bentonite (D)
1. Boring through Sand to Bedrock				
a. No groundwater	yes[7]			
b. Groundwater	yes[7]			
2. Boring through Sand into Bedrock				
a. No groundwater	yes[7]			
b. Groundwater		yes[1]		
c. Water in rock		yes[1]		
d. Artesian water in rock			yes[1]	
3. Boring through Clay to Bedrock				
a. No groundwater	yes[7]			
b. Groundwater	yes[7]			
4. Boring through Clay into Bedrock				
a. No groundwater	yes[7]			
b. Groundwater				yes[7]
c. Water in rock		yes[1]		
d. Artesian water in rock			yes[2]	
5. Boring through Clay, Sand, to/into Rock				
a. No groundwater	yes[7]			
b. Groundwater in sand or rock		yes[3]		
c. Shallow or perched water				yes
6. Boring through Clay				
a. No groundwater	yes[7]			
b. Groundwater	yes[7]			
7 Boring through Sand				
a. No groundwater	yes[7]			
b. Groundwater	yes[7]			
8. Boring through Alternate Strata of Sand and Clay				
a. One layer of sand	yes[7]			
b. One layer of clay				yes[4]
c. Several alternate layers				yes[4]
9. Borings Encountering Artesian Water				
a. Head more than 15' deep		yes[5]		
b. Head within 15' of surface			yes[6]	
c. Head above ground surface			yes[6]	
10. Borings Encountering Continual Flow of Gas, Sulphurous, or Other Noxious Substances at Any Depth			yes[6]	

Notes:
[1] Grout to top of rock
[2] Grout to minimum 5' above rock
[3] Grout to minimum 5' above sand
[4] Backfill to top of top clay stratum
[5] Grout entire boring
[6] Pressure grout at source
[7] Borings in areas of possible high risk of contamination (proposed landfill, treatment plants, etc.) shall not be backfilled with natural soil but shall be backfilled with bentonite.

Notes (cont.):

Cement Grout shall mean Portland Cement mixed with sufficient water to provide suitable consistency for placing or pumping.

Pressure Grouting shall mean injecting cement with a positive displacement pump, or other suitable devices which will maintain a pressure higher than the artesian head.

Bentonite shall mean any processed expansive colloidal clay.

Artesian Water shall mean any water which rises above its level to within 15' of the ground surface.

Borings drilled through soils or rock with profile not described in the foregoing categories must be effectively sealed to prevent movement of water between aquifers, or leakage at ground surface.

3.0 Special Cases

3.1 Piezometer or Standpipe Installation - Where required by the engineer or owner, a piezometer or standpipe shall be installed in the test boring upon completion of drilling. The piezometer or standpipe shall be sealed in a manner consistent with the requirements for such installation and, insofar as practicable, in conformance with the plugging methods set forth in Section 2.1 above. At such time as the piezometer is no longer required, it shall be sealed by grouting or by other appropriate means.

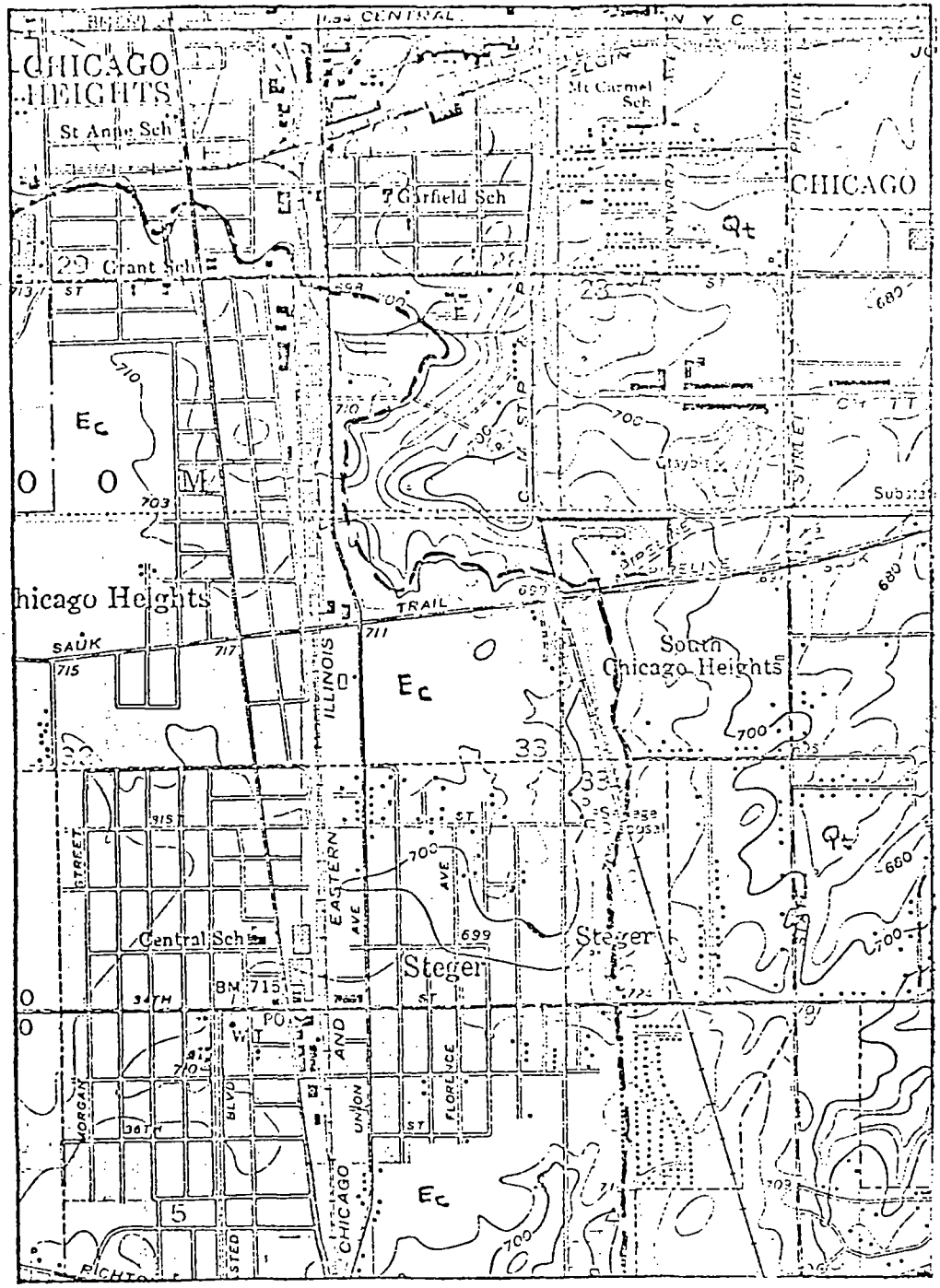
3.2 Holes Not Plugged - Where the requirements of the owner or engineer so dictate, holes shall be left open. Where necessary, casings shall be left in place to prevent caving of the holes or migration of fluids or gases from one stratum to another. At such time as the requirement to maintain the hole open ceases, the hole shall be plugged in accordance with the methods specified in 2.1 and 2.2 above.

4.0 Plugging Records - The driller's field notes and boring logs shall include the following information regarding the plugging of the borings:

A. Plugging method utilized.

B. Quantities of bentonite, grout, or other material utilized in plugging.

C. Any unusual conditions encountered during plugging such as excessive take of grout materials, leakage around exterior of casing, etc.



LEGEND:

Ec — EQUALITY FORMATION CARMI MEMBER (LAKE STEGER) (Yellow)

Qt — Tinley Terminal Moraine (Brown)

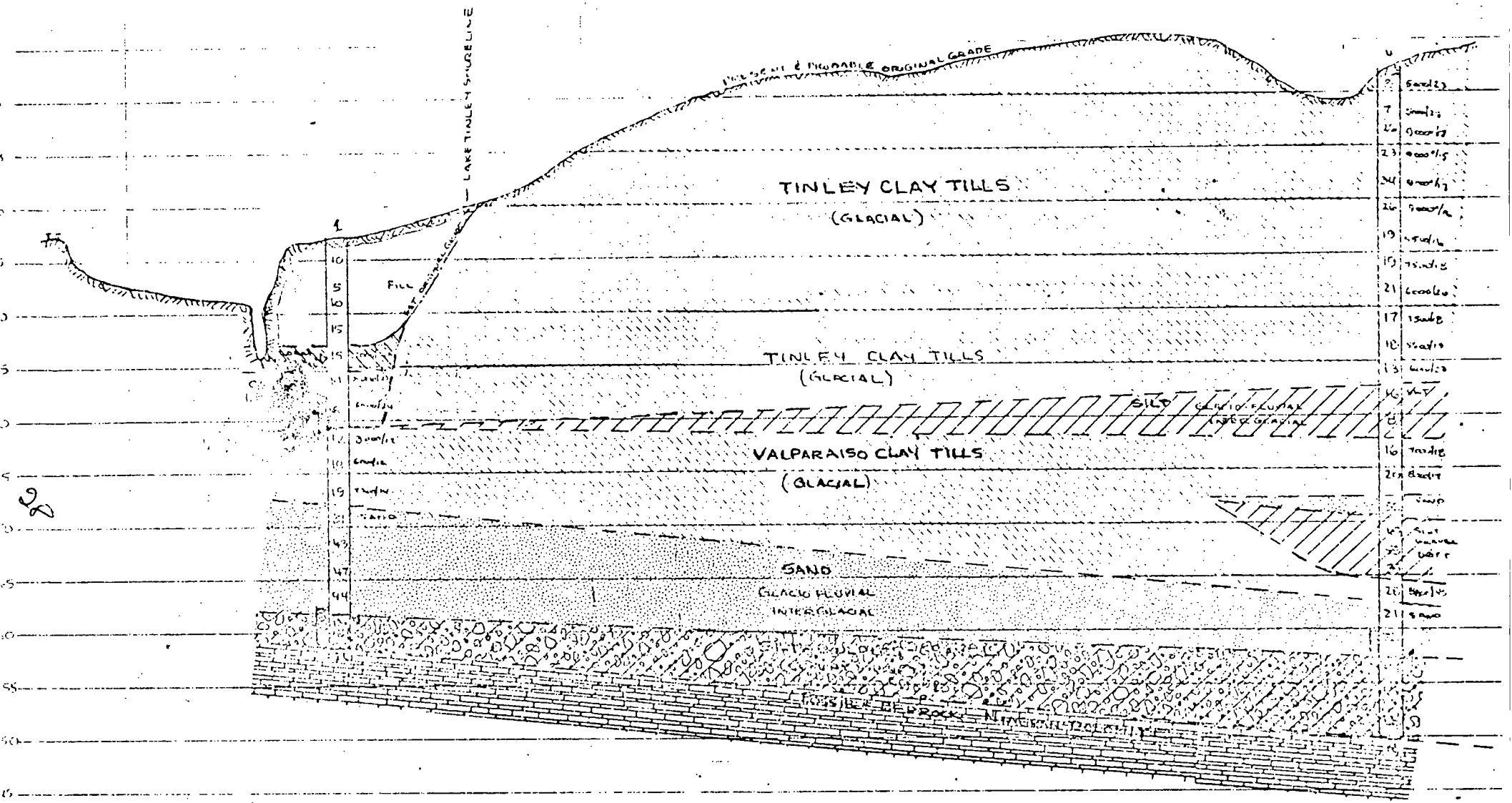
N

SURFICIAL GEOLOGY
SOLID WASTE DISPOSAL FACILITY
S. CHICAGO HEIGHTS, ILL.

WALTER H. FLOOD & CO. INC.

SCALE 1"=2000' ±	BY RJF
JOB/LAB NO. 72050068	DATE 6/5/73

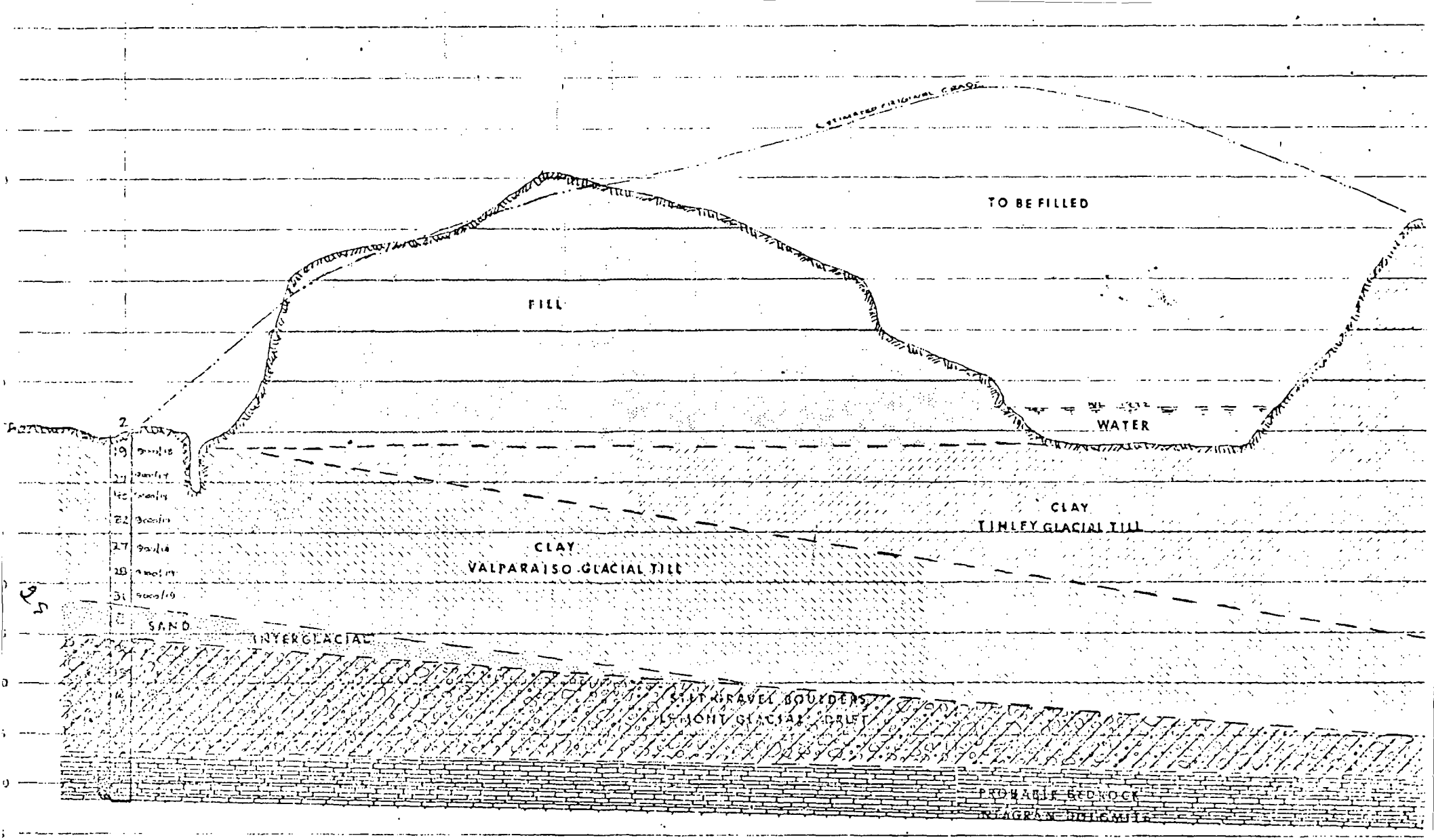
27



NOTE:
THE HORIZONTAL PROJECTIONS OF THE SOIL STRATA BETWEEN THE BORINGS HAS BEEN OBTAINED BY INTERPOLATION AND MAY NOT BE REPRESENTATIVE OF ACTUAL SOIL CONDITIONS BETWEEN BORINGS

LEGEND:
SEE ATTACHED SHEET

SOIL PROF
CHICAGO HEIG
WALTER H FLOOD & CO
ENGINEERS - CHICAGO IL
VERT. & HORIZONTAL SCALE 1"=10'
JUNE



NOTES:

THE HORIZONTAL PROJECTIONS OF THE SOIL STRATA BETWEEN THE BORINGS HAVE BEEN OBTAINED BY INTERPOLATION BETWEEN THE BORINGS AND MAY NOT BE REPRESENTATIVE OF ACTUAL SOIL CONDITIONS.

LEGEND:

SEE ATTACHED LEGEND SHEET

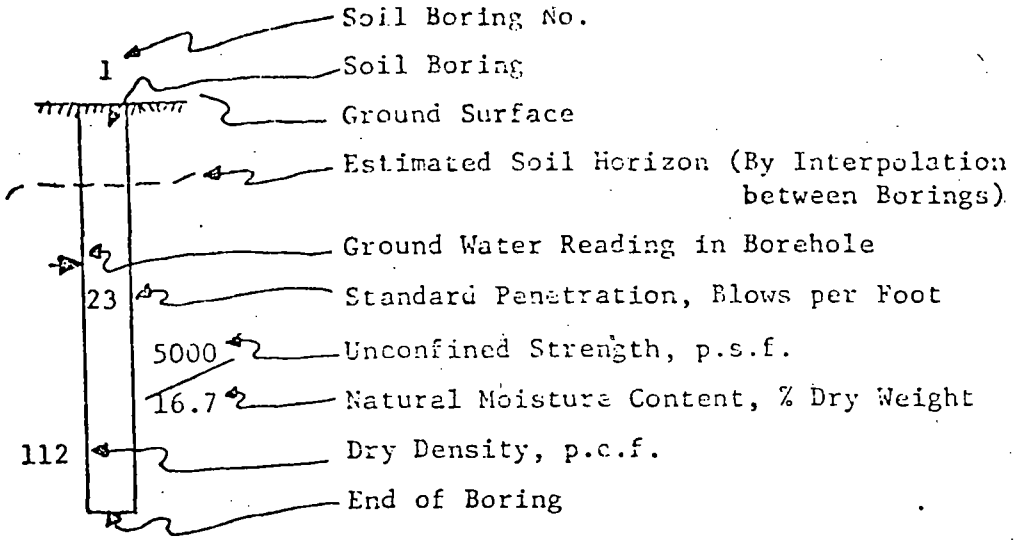
SOIL PROF

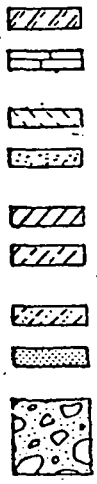
CHICAGO HEI

WALTER H FLOO
ENGINEERS - C

VERT SCALE 1"=10' | JO

HOR SCALE 1"=100' | JOB





Topsoil Loam

Bedrock (Dolomite)

Clay

Sand

Silt

Silty clay

Sandy clay

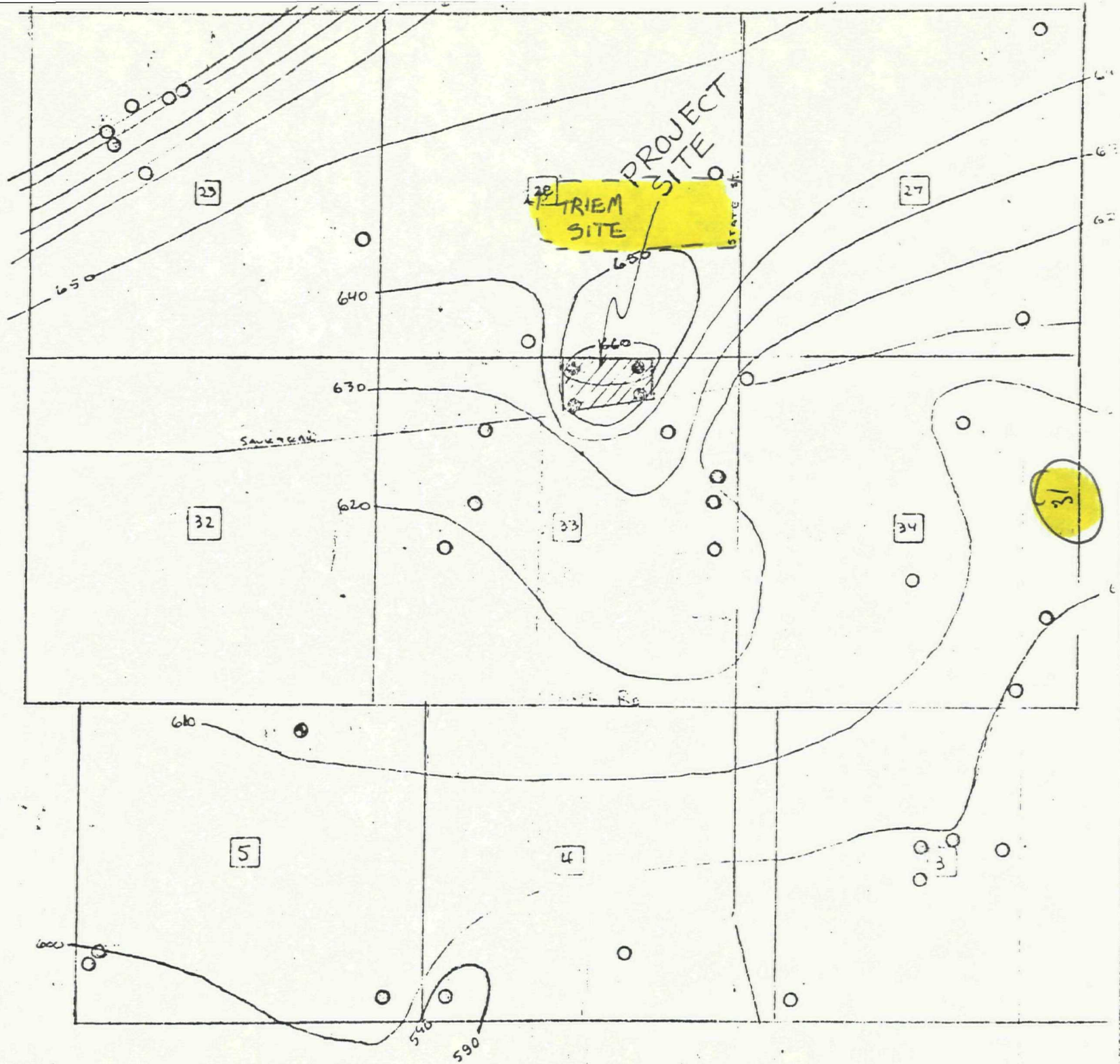
Fill

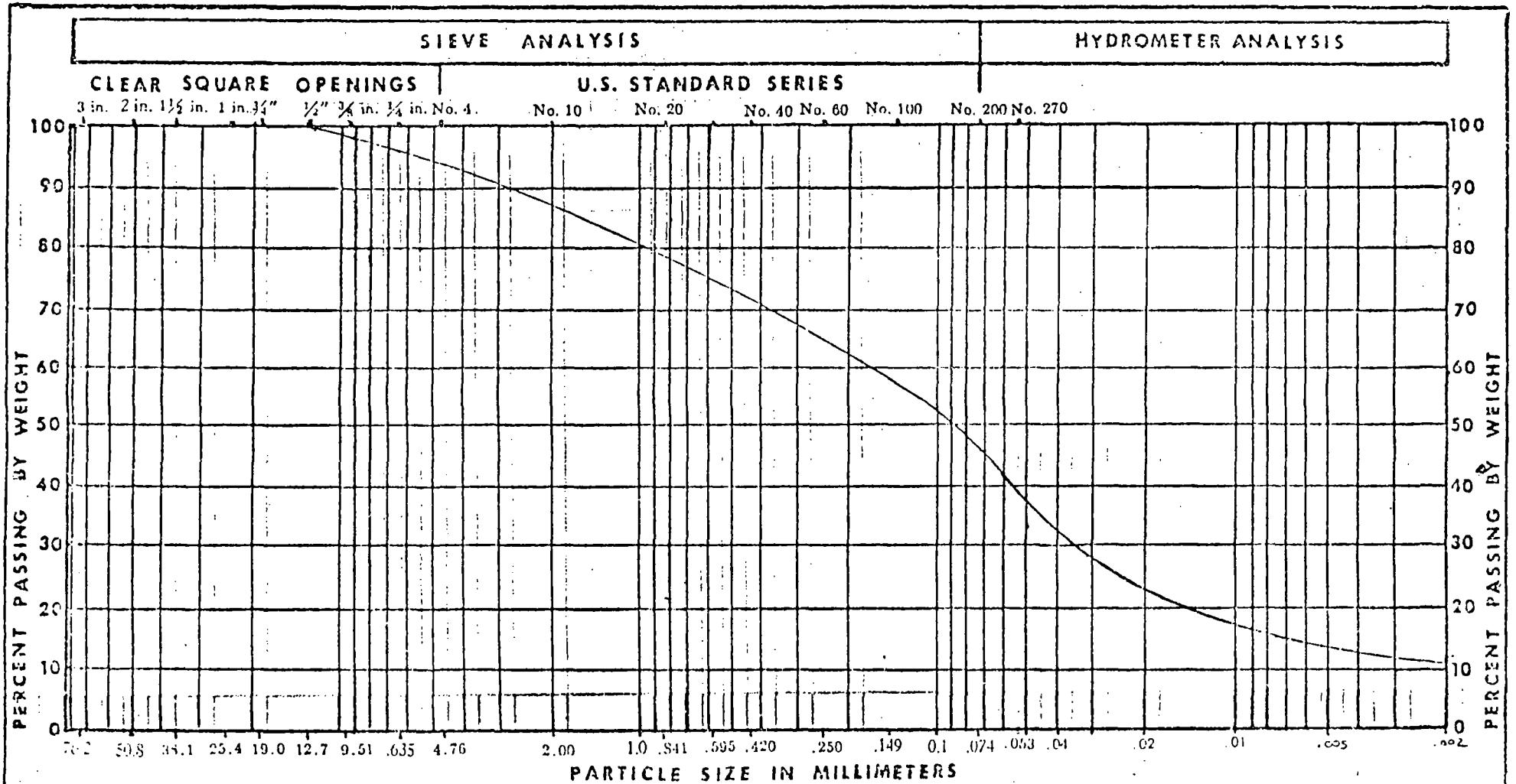
Gravel, Sand and Boulders

WELL POINT (PIEZOMETER) SCREEN

Soil Profile Legend

WALTER H. FLOOD & CO., INC.


PROJECT SITE
TRIEM SITE
STATE ST.
650
640
660
630
620
610
600
590
540
23
28
27
32
33
34
31
5
4
3



BORE NO. 4 SAMPLE NO. 25	
DESCRIPTION LEMONT DRIFT (SAND LOAM)	
CLASSIFICATION	

LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	
SHRINKAGE LIMIT	

SOIL GRADATION ANALYSIS

SOLID WASTE DISPOSAL FACILITY
SOUTH CHICAGO HEIGHTS, ILL

JOB NO. 72050048 DATE 6/22/72

WALTER H. FLOOD AND COMPANY INC.
CHICAGO ILLINOIS 60637

32

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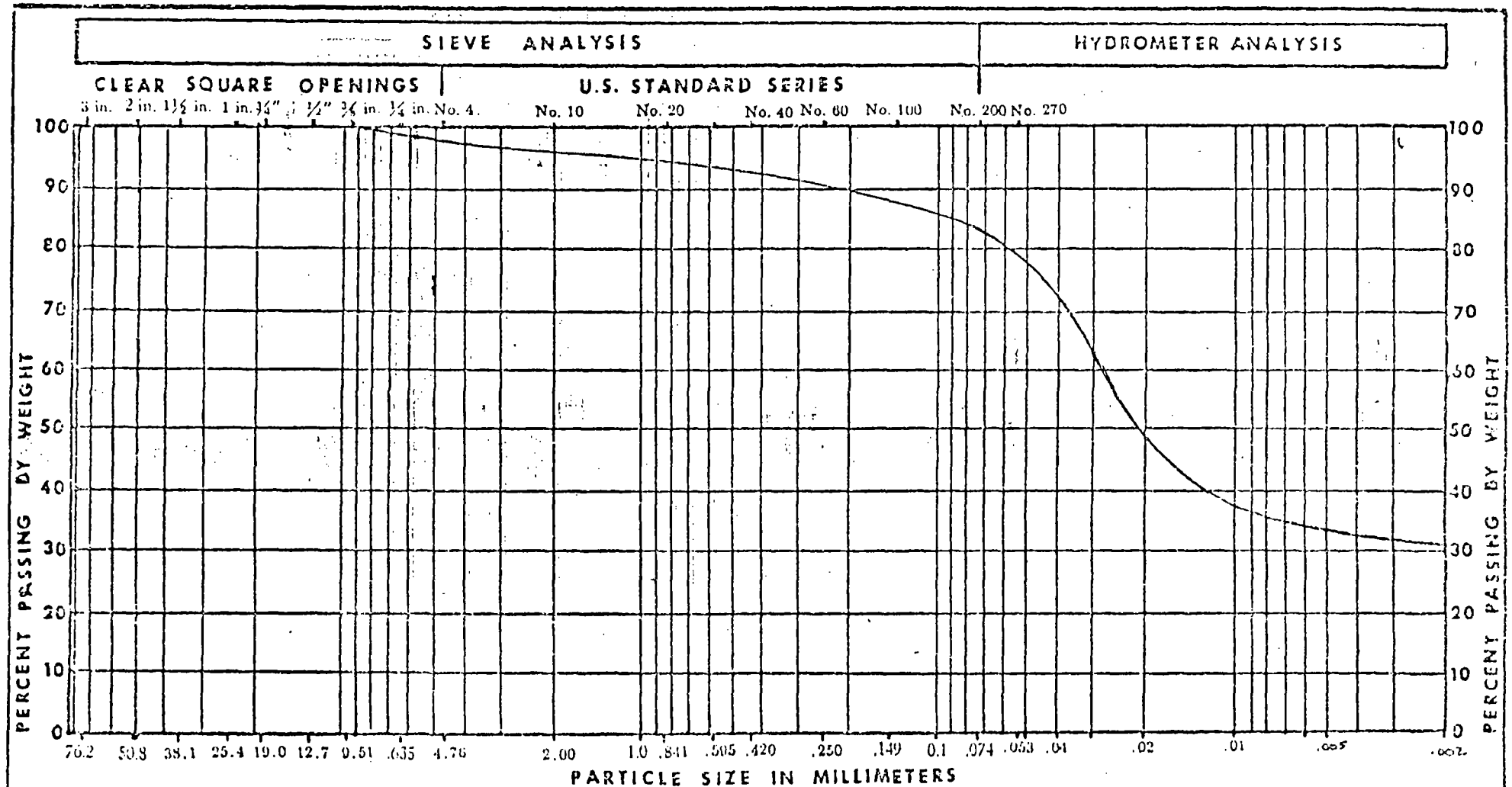

BORE NO. 2 SAMPLE NO. 5	
DESCRIPTION VALPARAISO CLAY TILL (SILTY CLAY LOAM)	
CLASSIFICATION	

LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	
SHRINKAGE LIMIT	
COEFFICIENT OF PERMEABILITY	4.8×10^{-7} CM/SEC

SOIL GRADATION ANALYSIS

SOLID WASTE DISPOSAL FACILITY
S. CHICAGO HEIGHTS, ILLINOIS

JOB NO. 7205C068 DATE 6/22/72

WALTER H. FLOOD AND COMPANY INC.
CHICAGO ILLINOIS 60637

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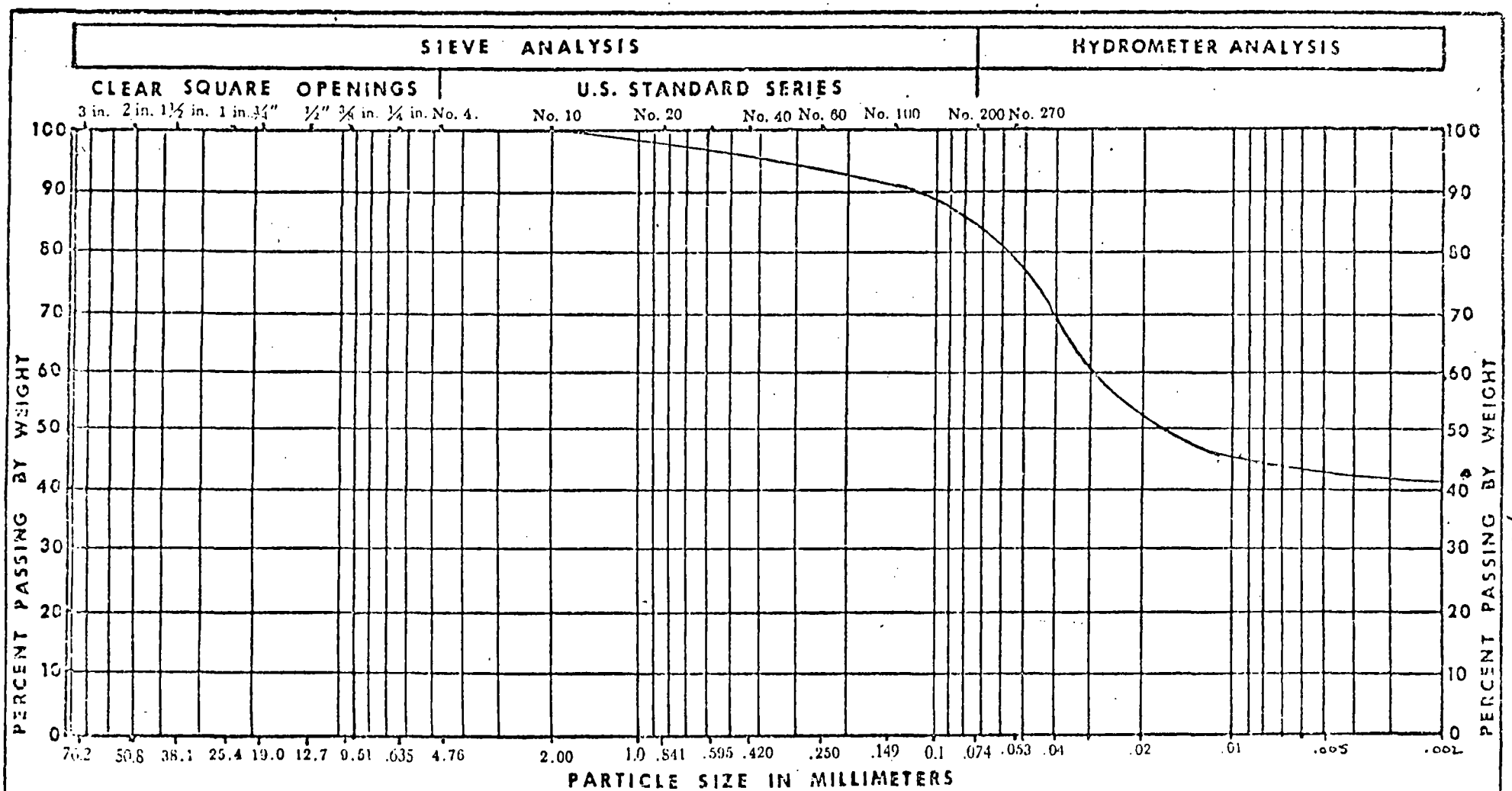

BORE NO. 3 SAMPLE NO. 6	
DESCRIPTION TINLEY CLAY TILL	
CLASSIFICATION	

LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	
SHRINKAGE LIMIT	
COFFICIENT OF PERMEABILITY	2.1×10^{-7} CM/SEC

SOIL GRADATION ANALYSIS

SOLID WASTE DISPOSAL FACILITY
S. CHICAGO HEIGHTS, ILLINOIS

JOB NO. 72050068 | DATE 6/22/73

WALTER H. FLOOD AND COMPANY INC.
CHICAGO ILLINOIS 60637

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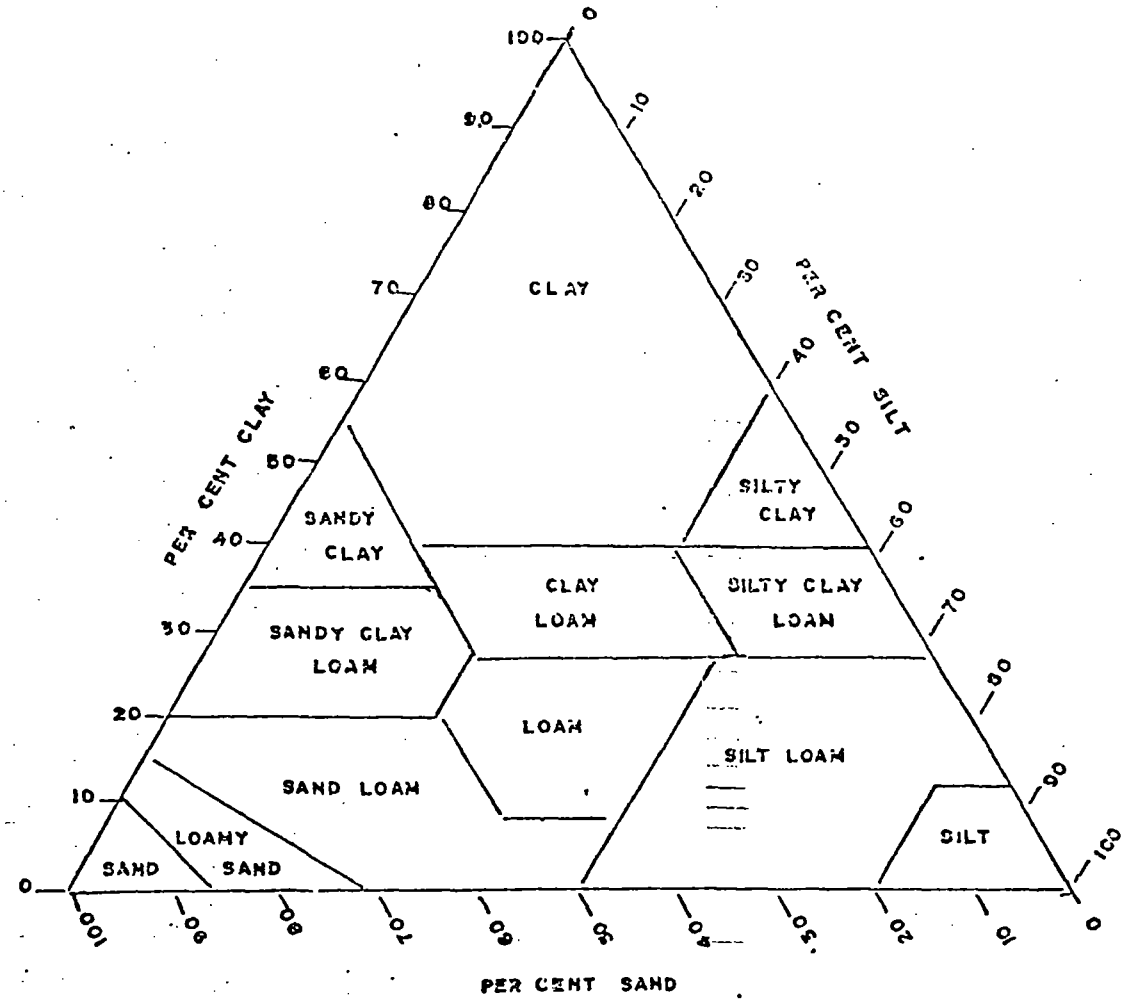


SOIL TEXTURAL CLASSIFICATION
U.S. DEPARTMENT OF AGRICULTURE

WALTER H. FLOOD & CO. INC.

	BY
JOB/LAB NO.	DATE

FORM 1 SM 6-66 SSP

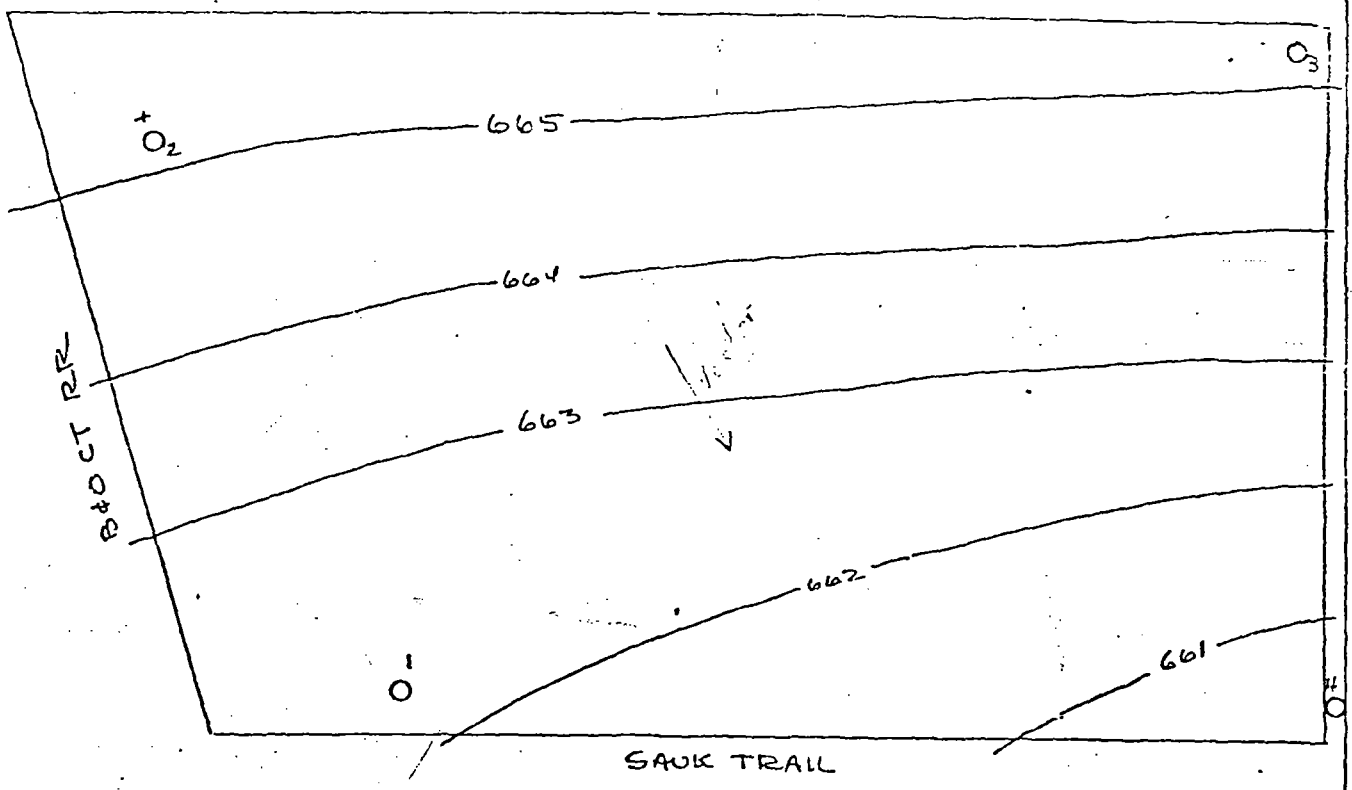
APPLICATION FOR PERMIT TO DEVELOP AND OPERATE A SOLID WASTE MANAGEMENT SITE

Appendix

Summary of Observation Well Data

Well No.	1	2	3	4
Ground Elevation	697.1	694.9	713.4	712.6
Top of Well Elevation	698.2	695.1	715.5	716.6
Date Installed	5/30/72	5/24/72	5/26/72	5/31/72
Well Size	2" ID	2" ID	2" ID	2" ID
Well Casing	PVC	PVC	PVC	PVC
Screen Size	#10	#10	#10	#10
Screen Length	3'	3'	3'	3'
Tip Elevation	656.9	658.9	657.5	656.9
GWLs				
24 hours after installation	662.0	664.8	663.7	661.0
7/7/72	661.8	665.0	664.8	660.2
7/19/72	661.8	665.4	666.2	660.2
1/19/73	663.8	665.1	665.5	661.2
2/22/73	662.6	665.7	665.2	661.0
	662.9	665.2	665.05	660.72
Est. rate slug test[1] 9PM	.07	.03	.64	.02
Date Sampled	2/23/73	2/23/73	2/23/73	Not tested

663.34



LEGEND

O PIEZOMETER

—661— PIEZOMETRIC GROUNDWATER SURFACE (DETERMINED BY AVERAGE READINGS FROM PIEZOMETER)

PIEZOMETRIC GROUND WATER SURFACE
SILURIAN NIAGRAN AQUIFER
SOLID WASTE DISPOSAL SITE
S. CHICAGO HEIGHTS, ILLINOIS

WALTER H. FLOOD & CO. INC.

SCALE 1" = 200'	BY RJF
JOB/LAB NO. 12050068	DATE 5/10/13

WALTER H. FLOOD & CO., INC.

Job No. [illegible]

Procedure for Installation of Observation Wells

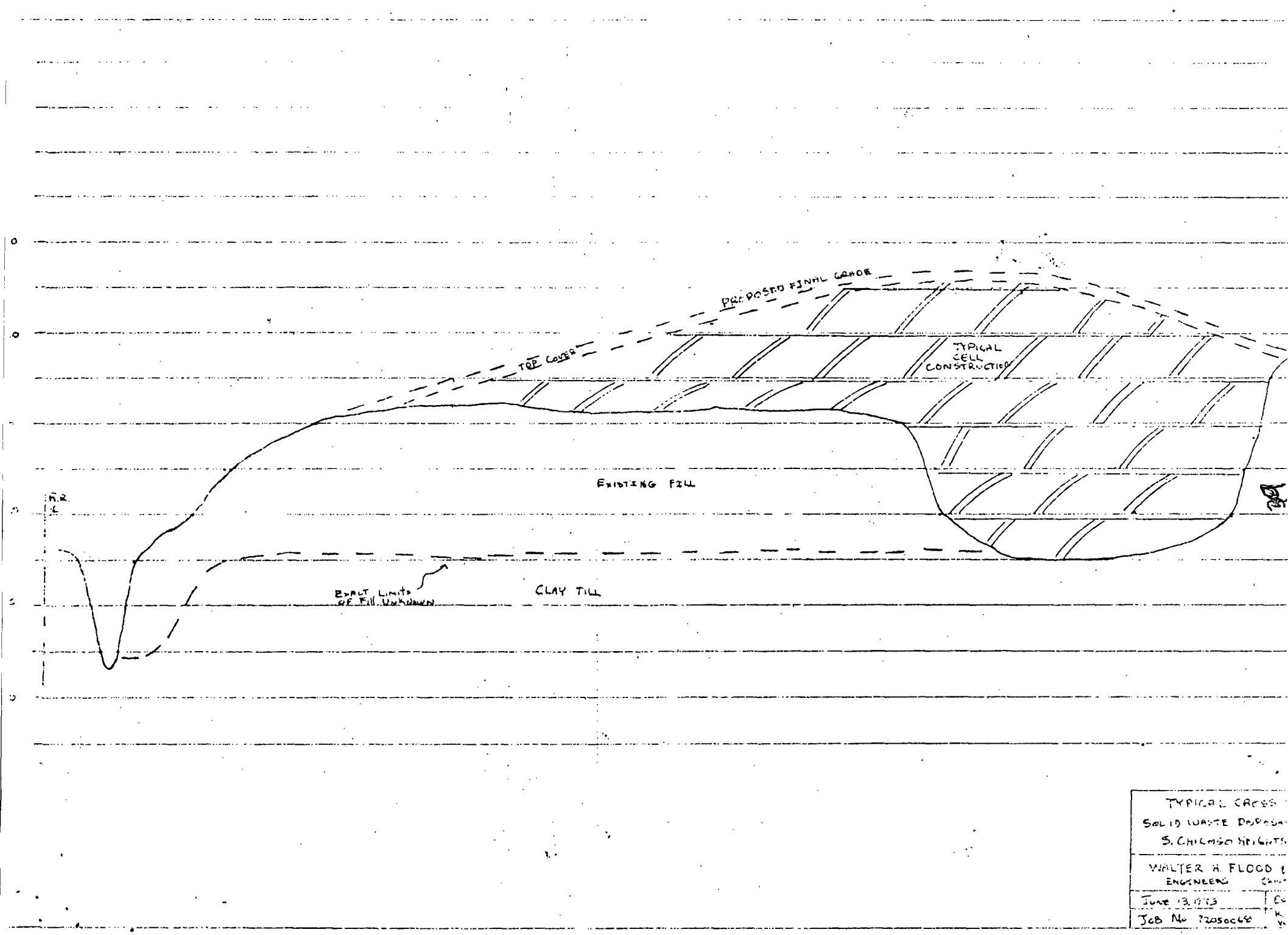
Scope: Two wells are to be installed at each corner of the pit. One well is to be installed a minimum of 5 feet into the bedrock, the other well is to be installed in water-bearing sand above the bedrock, or as designated. The wells are to be [illegible] observation wells for observation of water level and for sampling.

Procedures: Overburden is to be drilled by normal methods, and split tube samples to be taken at 2.5 foot maximum intervals. A log of the overburden will be kept recording soil descriptions, standard penetrations, ground water encountered.

Bedrock is to be cored, minimum diameter of 2 3/8" hole, for a minimum depth of 5 feet. Core shall be labeled and boxed for classification and identification.

A 2 inch I.D., 1'0" long #8 or #10 screened well point, and 2 inch I.D. riser pipe is to be placed in the hole. The test hole will be blown with air or back flushed with clean water. If water is used, backflushing will continue until clean water is obtained as determined by Chloride test. Clean torpedo sand will be placed in the hole to come to near the bedrock surface. If bore hole is dry, bentonite pellets & soil mixture will be placed above the sand pack for a minimum of 3 feet or as determined by overburden soil conditions to water-bearing sand above. If hole is wet, a bentonite mud shall be mixed, and pumped to the bottom of the hole by using a drill rod or other pipe, and gradually with drawing rod or pipe until "mud" seal is placed to sufficient thickness. A second 2 inch I.D., 3'0" #8 or #10 screened well point and riser shall be placed in the water bearing sand layer in the same drilled hole, or if conditions do not permit, in another drilled hole, a maximum of 2 feet from original hole. If another hole is used, the first riser shall be backfilled with sand to within 5 feet of grade before drilling another hole. Second well point shall be placed in the water bearing sand layer and blown out with air, or backflushed with clean water as previously detailed. The second well point will then be backfilled with clean sand to 5 feet from the ground surface. The top 5 feet of the test hole shall be filled with a 5% bentonite - soil mixture. All depths of installations shall be recorded to the nearest inch. Water levels shall be recorded in each until static levels are reached.

The rock [illegible] shall be pumped or bailed to lower the water level in each and the [illegible] readings taken on both wells. If pumping [illegible] the rock [illegible] effects [illegible]



TYPICAL CROSS
SOLID WASTE DISPOSAL
S. CHICAGO HEIGHTS
WALTER H. FLOOD &
ENGINEERS
JUNE 13, 1973
JOB No 7205068